

POPULATION CHANGE AND ECONOMIC  
DEVELOPMENT: WHAT HAVE WE LEARNED  
FROM THE EAST ASIA EXPERIENCE?

by

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## **Population Change and Economic Development: What Have We Learned from the East Asia Experience?**

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The twentieth century was a period of unprecedented demographic change. The global population increased nearly fourfold, growing from 1.6 billion in 1900 to 6 billion in 2000 (Cohen 1995, App. 2, 400–401; UN 1998). Population growth rates accelerated, particularly in the developing world, during the first part of the century, reaching a peak in the late 1960s. The response to rapid population growth was also unprecedented. Motivated by concerns about the environmental and economic effects of population growth, the United Nations, bilateral foreign aid agencies, multilateral institutions, and private foundations invested billions of dollars in population programs. Many developing-country governments, especially in Asia, vigorously pursued policies aimed at slowing population growth.

The countries of East Asia were among the first and most active proponents of population policy.<sup>2</sup> Beginning in the 1960s, many East Asian developing countries abandoned pronatalist policies, identified population stabilization as a national development objective, and adopted comprehensive programs intended to slow population growth. At first glance, the East Asian experience appears to provide strong support for the value of population stabilization policies. Childbearing and population growth rates dropped more rapidly there than in any other region of

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<sup>2</sup> Throughout this paper we use the term East Asia to refer to countries in both Northeast and Southeast Asia.

the developing or industrialized world. During the same period the countries of East Asia achieved unparalleled economic success. Within three decades, 1960–90, they were transformed from an economic backwater to the most dynamic region in the world economy. Countries that were impoverished in 1960 joined the ranks and, in some respects, surpassed the high-income countries of the West.

The research summarized in this paper examines the connections between demographic change and economic development in East Asia with the goal of determining whether or not demographic change, in general, and population policy, in particular, played an important role in East Asia's economic success. The results of the study are reported in two volumes. One volume examines the development impact of demographic change (Mason forthcoming **a**). Specifically, what aspects of the region's development were influenced by demographic trends? What were the mechanisms through which population influenced the East Asian economies? What institutional, political, social, and economic features conditioned the influence of population on development? The focus of the second volume is on population policy in East Asia. What policies and programs were implemented and at what cost? What evidence is there that East Asia's population policies achieved their demographic goals? Were there features of these programs that led to their success and offer lessons for other countries?

The study concentrates on the experience between 1960 and 1990 of six East Asian economies: Japan, South Korea, Taiwan, Singapore, Thailand, and Indonesia. These countries were selected for several reasons. First, they are the first group of developing countries to achieve low fertility, fertility low enough, except in Indonesia's case, to produce zero or negative population growth. The transition from high to low fertility has been so compressed that we actually have an historical record of the entire transition and accompanying economic changes. The demographic changes – the decline in fertility, the rise in life expectancy, and the swings in age structure – have been so substantial that their development effects should be evident if population really does matter.

Second, the governments of East Asia changed course with respect to population policy early in the post-World War II era. They abandoned the view that a large and growing population was a source of national strength, and embraced the view that population growth was a threat to development goals. Within a relatively brief period of time, pro-natalist policies were abandoned and, over time, a wide variety of anti-natalist programs and policies were adopted. Governments engaged in educational programs, increased the availability of contraceptives supplies and services, urged their citizens to adopt small family norms, and relied on incentives and disincentives to encourage couples to bear fewer children. The countries examined in this study, however, did not resort to coercive programs, such as India's short-lived compulsory sterilization program or China's one child policy.

Third, the East Asian experience is instructive because the development policy environment was so outstanding. Many scholars have maintained that rapid population growth exacerbates the costs of poor economic policy. Less clear, however, has been the impact of population variables in an environment of outstanding policy formulation and implementation. Of course, the countries of East Asia have made mistakes, as recent events have so convincingly demonstrated, but few countries have matched their record over the post-World War II era.

Although the shared experience of the six economies motivates this study, their differences are also instructive. The economies span a wide range of development and demographic circumstances. Income levels in Japan and Singapore were substantially higher than those in Thailand and Indonesia in 1960. Women in Japan were already bearing only two children each in 1960, whereas in Indonesia fertility decline did not begin until the late 1960s. The populations of Indonesia and Japan are among the largest in the world; Singapore's is among the smallest. Immigration was an important component of demographic change in Singapore, but not elsewhere. Regional variation in the populations and economies of Thailand and Indonesia are critical to an understanding of development in those countries, much more so than in Taiwan or South Korea. The countries of Northeast Asia were densely populated by 1960 and had limited

natural resources. Thailand, on the other hand, was still bringing land under cultivation in 1960, and Indonesia's development during the 1970s was aided by vast petroleum reserves.

### East Asia's Success

In the 1950s the countries of East Asia were poor and their prospects did not seem promising. By 1960 per capita income in Japan had not yet reached \$3000, less than one-third of the US level. In the other countries, per capita GDP was even lower, ranging from as little as \$600 in Indonesia to as much as \$1700 in Singapore.<sup>3</sup> Histories of foreign domination, except in Japan and Thailand, had undermined the development of strong political and economic institutions. Much of the region's wealth and the institutions that did exist were destroyed by revolution and war – World War II, civil war in China, and the Korean war. Efforts to rebuild physical infrastructure and industrialization were hampered by very low saving and investment rates. The economies were overwhelmingly agricultural and especially in Northeast Asia prospects for increasing food production or agricultural employment appeared to be bleak because of the limited supply of agricultural land. With the exception of Indonesia's large petroleum reserves, the countries were poorly endowed in natural resources.

Accelerating rates of population growth were also a serious concern. Taiwan and South Korea both experienced large population inflows. More than a million Chinese nationalists fled to Taiwan from the mainland in 1949 and 1950. South Korea experienced two large-scale migrations – the first a repatriation of Koreans after the defeat of Japan in World War II, the second an influx from North Korea when China entered the Korean War. By the late 1950s and early 1960s, however, rapid population growth could be traced to declining death rates and high birth rates. Birth rates had declined in Japan, but elsewhere women were averaging about six

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<sup>3</sup> All GDP figures in this chapter are expressed in 1985 international prices and taken from the Penn World Tables (Summers and Heston 1991).

births each over their reproductive span. Given mortality conditions earlier in the 20<sup>th</sup> century, many children died during the first few years of life. But significant declines in infant and child mortality led to much larger families and more rapid population growth.

There were a few bright spots. Wealth and income inequality were relatively low in Northeast Asia. In part, this was a consequence of war-time destruction and, in part, the result of major land reform programs in Taiwan and South Korea. The countries enjoyed relatively high levels of literacy and significant pools of educated manpower. Substantial levels of foreign assistance, especially from the US, helped with reconstruction efforts.

No one anticipated the economic success that the countries of East Asia would enjoy over the coming decades. Economic growth was exceptionally high in Japan beginning in the 1950s, in South Korea, Taiwan, Singapore, and Thailand beginning in the 1960s, and in Indonesia beginning in the 1970s. Between 1960 and 1990, real per capita gross domestic product grew at annual rate of more than 6 percent in South Korea, Singapore, and Taiwan, at 5.3 percent in Japan, 4.4 percent in Thailand, and 3.8 percent in Indonesia. During the same period, US growth averaged 2.0 percent per year. Per capita income in South Korea increased from \$900 in 1960 to \$6700 in 1990. In Singapore, per capita income rose from \$1700 to \$11,700 during the same period (Summers and Heston 1991).

The rise in per capita income is just one of many features of the region's economic success. Despite the limited supply of agricultural land, food production grew rapidly, easily outstripping population growth. Growth in the industrial and service sectors provided employment opportunities more than sufficient to match the rapidly growing working-age population and the increased entry of women into the workforce. Universal literacy and substantial improvements in educational attainment were achieved. Rates of saving and investment increased to high levels and the more advanced economies became major lenders on international capital markets. The status of women improved, with substantial declines in the gender gap in educational attainment, employment, and wages in many countries.

Demographic change in East Asia was as dramatic as economic change. Infant and child mortality rates dropped to low levels and life expectancy at birth approached and in Japan surpassed levels found in the West. The drop from high to low fertility came with remarkable speed. Of all the countries with high fertility in 1960, in only six were women averaging two or fewer births by 1990: Taiwan, South Korea, Thailand, Singapore, Hong Kong, and China. Of 36 countries with a per capita income of less than US\$1,000 and a population in excess of 2 million in 1960, only five had achieved a total fertility rate of 3 births or less per woman by 1990: China, South Korea, Thailand, Indonesia, and Romania (Feeney and Mason, forthcoming).

Changes in fertility and mortality influenced two other important demographic variables, population growth and population age structure. By the early 1990s, Japan's population growth had dropped to only 0.2 percent per annum. Population growth in South Korea, Taiwan, Singapore, and Thailand had declined to about 1 percent per annum. In Indonesia, where fertility declined somewhat later, population growth had dropped to 1.6 percent per annum by 1990-94. Despite the shift to slower growth, the countries of East Asia did not avoid large increases in their populations. Between 1950 and 1995, Japan's population increased by fifty percent, the populations of South Korea and Indonesia more than doubled, and those of Taiwan, Singapore, and Thailand nearly tripled (Feeney and Mason forthcoming).

Why did populations increase so substantially despite the dramatic decline in childbearing? The phenomenon, called *population momentum*, occurs because rapidly growing populations have a characteristic age structure that favors population growth. Large percentages of these populations are young adults, who are bearing children, and small percentages are at older ages where the risks of mortality are high. Such an age structure leads to an elevated birth rate, a depressed death rate, and consequently more rapid population growth. Slowly the age structure evolves as a result of lower fertility and higher life expectancy. The percentage in the childbearing years drops and the percentage at high mortality ages increases leading to slower population growth. Eventually population growth stops if women average about two births each

during their lifetime, replacement fertility, or populations begin to decline if fertility remains below replacement level.

Japan's population is expected to begin declining during this decade, but the other countries of East Asia should continue to experience moderate population growth for at least several more decades. Recent UN population projections anticipate that Thailand will continue to experience population growth until 2040 and that Indonesia's population will still be growing in 2045-2050, the last period for which projections are available (UN 1998). Nonetheless, the era of rapid population growth has ended in East Asia and populations are much smaller than would have been the case had fertility remained at high levels or declined only gradually.

Changes in age structure in East Asia have been large and have occurred rapidly as compared with other countries. Of particular importance to economic growth have been changes in size of the working-age population relative to dependent populations, those who are either too young or too old to work. Most East Asian countries have gone through three phases. During the first phase, the dependent populations were growing relative to working-age populations because declining infant and child mortality rates led to rapid growth in child populations. During the second phase, working-age populations were growing relative to dependent populations. The numbers of dependent children stabilized with lower birth rates, but working age populations continued to grow rapidly with the entry of large cohorts of young workers. The second phase dominated changes in age structure in East Asia during the 1960-90 period. Japan has entered the third phase and other countries will follow in the coming decades. During this phase, growth of the working age populations slows while older dependent populations continue to experience rapid growth. Consequently, the working-age populations will decline relative to dependent populations.



These three phases are captured by the economic support ratio, which measures the working population relative to the consuming population.<sup>4</sup> Figure 1 illustrates using the support ratio for Southeast Asia. The first phase during which the support ratio deteriorated is evident during the 1950s and the 1960s. The second phase began in the 1970s and is projected to last for six decades. During that period, the number of workers per consumer is expected to increase from 0.50 to 0.62 and increase of 24 percent. Starting in the 2020s, the support ratio is projected to begin a long and sustained descent. Two alternative representations of the support ratio are provided in the lower panel of Figure 1. The first gives the average annual rate of growth for each decade. The horizontal bar represents the three phases and reports the average rate of growth during each phase.

Figure 1. Economic Support Ratio, Southeast Asia.

The varied patterns in the support ratio and the distinctive features of East Asia are evident in Figure 2. In South Korea and Indonesia, the growth phase of the support ratio is expected to last for five decades and the annual rates of increase are substantial. Taiwan and Singapore experienced similar changes (figures are not shown). Changes in age structure in Thailand and the Philippines have also been favorable, but the increase in the support ratio has

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<sup>4</sup> The support ratio can be refined to incorporate age-variation in productivity and consumption needs. In this case, the numerator weights the population in each age by the average productivity of workers in that age group, usually measured using the age-earnings profile. The denominator allows for age-variation in consumption needs by using weights that are typically lower for children and may be lower or higher for the elderly than for prime age adults. Lee, Mason, and Miller forthcoming provide detailed calculations for Taiwan. The results presented here use a consumer weight of 0.5 for children aged 0-14 and a weight of one for all other ages.

been somewhat smaller than in Indonesia or South Korea. Japan's growth phase is now complete. In India, where fertility decline began later and has been slower than in East Asia, the growth phase of the support ratio is both short in duration and modest in level. In Bangladesh, where fertility decline has been more rapid in recent years, the trend in the support ratio is more favorable.

Figure 2. Growth Rates (%) of Economic Support Ratios, Selected Asian Countries

The analysis presented in *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* examines the connection between the important demographic changes that occurred in East Asia and key economic variables, e.g., innovation, labor productivity, saving and investment, international capital flows, health, education, per capita income and inequality.<sup>5</sup>

### The Challenges of Population Growth

In 1960, East Asian countries faced two challenges – feeding rapidly growing populations and providing good jobs for rapidly growing and, except in Japan and Singapore, predominantly rural labor forces. Despite the speed of fertility decline, substantial population growth was unavoidable for reasons discussed above. Population policy, no matter how effective, could not achieve population stabilization overnight. With one important exception, however, population growth did not impede East Asia's development efforts.

The food challenge was met with resounding success. Food output per capita increased by 36 percent in Asia and 47 percent in East Asia between 1963 and 1992 despite its limited supply of agricultural land. During the same period, food production per capita increased by only

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<sup>5</sup> See Bloom and Williamson 1998 for a similar approach.

13 percent in Latin America and declined by 7 percent in Africa. East Asia succeeded by greatly increasing agricultural yields. Increased demand for food caused primarily by population growth, in conjunction with substantially lower fertilizer prices, led to the development of new high-yielding rice and wheat varieties (Hayami forthcoming).

The employment challenge was met more successfully in East than in Southeast Asia. In Japan, Taiwan, and South Korea, where the supply of land was especially limited, employment opportunities were created through changes in industrial and occupational structure. Despite growth in the total labor force, the agricultural labor force declined by 4 percent per year in Japan, by 2 percent annually in Taiwan, and by 1 percent annually in South Korea between 1960 and 1990. Expansion of manufacturing and service sectors was so rapid that the limited availability of land had no bearing on employment. Thailand and Indonesia responded somewhat differently to rapid labor force growth. In both countries, land under cultivation increased during this period. Thailand, in particular, managed to absorb substantial numbers of agricultural workers with no substantial decline in arable land per agricultural worker. Of the countries examined in this study only Indonesia experienced a significant drop in arable land per agricultural worker. Non-agricultural employment also grew very rapidly in Thailand and Indonesia, but the manufacturing and service sectors were so small in 1960 that even their rapid growth was insufficient to absorb the large number of new workers. In both countries labor productivity in the agricultural sector grew much more slowly than in the non-agricultural sector. Not only was this a drag on economic growth but also a source of rising inequality (Table 1).

Insert Table 1 about here.

In retrospect, fears about the development impact of population growth *per se* were probably exaggerated in East Asia. Substantial population growth was accommodated in Northeast Asia with no apparent adverse economic effects and in Southeast Asia with only modest difficulties. Several points, however, should be born in mind. The first is that adverse

effects of population growth may have been avoided, in part, because population growth did slow substantially during this period.

The second point is that the favorable outcome in East Asia was not automatic, but a consequence of very effective development policy combined with a favorable international economic environment. East Asia's experience with agricultural innovation illustrates this point. Even before the mid-1960s, population growth was substantial, the price of fertilizer had declined, high-yielding varieties were available for temperate zones, and major advances were possible with relatively modest effort. Yet, gains in yield were unimpressive until after 1965 when a *social decision* was made to invest in research that would otherwise not have taken place. Moreover, as compared with other regions of the world, Asia had relatively well-developed transportation and irrigation systems, that were essential elements of the green revolution. Both research efforts and infrastructure systems require the existence of political institutions that can effectively identify and respond to public needs (Hayami forthcoming).

The third point is that rapid changes in age structure, childbearing, and life expectancy created opportunities for more rapid economic growth in East Asia even as population growth abated. The opportunities came in three forms: the emergence of a large gap between population growth and potential labor force growth; changes in incentives and age structure that favored higher rates of saving and investment; and, changes in incentives and age structure that favored greater human resource investment. A major part of the East Asian success story is how the region seized these opportunities.

### Demographic Change and Development Opportunities

Between 1960 and 1990 the gap between labor force growth and population growth was so large that the region's labor force increased by 25 percent more than the population, accelerating per capita income growth by about 0.8 percent per year (Table 2). Labor force growth slowed much more slowly than population growth because of favorable changes in age structure and because of

increased female labor force participation. The greater involvement of women in the formal labor force can be traced to a complex set of changes, some demographic (later age at marriage and declining childrearing responsibilities), others economic (rising wages and changes in employment structure), and still others political (changes in tax codes and policies toward discrimination) (see Bauer forthcoming, Okunishi forthcoming).

Insert Table 2 about here.

Rising rates of saving and investment are often cited as one of the most important sources of East Asia economic growth (Bauer forthcoming). Why saving and investment rates increased so dramatically and the influence of demographics is a controversial issue examined thoroughly in this project. Recent research shows that changes in age structure, childbearing, and life expectancy have an effect on saving rates, but estimates of the size of the effect vary greatly from study to study (Table 3). Particularly large effects are found in three studies (Williamson and Higgins forthcoming, Kelley and Schmidt 1996, and Toh forthcoming) based on the analysis of aggregate saving data. These authors found that changes in age structure over the demographic transition, using Taiwan's experience to facilitate comparison, lead to a rise in the gross national saving rate by between 25 and 45 percentage points. Lee, Mason, and Miller (forthcoming, 2000) rely on a simulation approach and conclude that demographics could account for no more than an increase of 14.5 percentage points. Deaton and Paxson (2000) analyze household saving rates for Taiwan and conclude that changes in age structure can account for an increase of 6.5 percentage points.

Insert Table 3 about here.

These estimates are difficult to compare given the different measures of saving on which they are based. In all cases, however, the estimated shifts in saving induced by demographics are economically significant. Thus, the impact of demographic change is greater than suggested by the standard neoclassical model. A growth accounting exercise allows us summarize. Employing a "middle-of-the-road" estimate of the saving effects, available only for Taiwan, leads to the

conclusion that higher rates of saving and investment *due to changing demographics* accounted for 18 percent of the increase in output per worker. When combined with the gap between population and labor force growth, it appears that demographics accounted for about 27.7 percent of the increase in output per capita between 1960 and 1990 in Taiwan (Table 4, last column). This compares with an estimate based on econometric evidence by Bloom and Williamson (1998) that demographics accounted for about one-third of East Asia's 'economic miracle'. The effects of demographics in Singapore and South Korea were probably similar in magnitude. In Japan, most of the increase in the support ratio occurred prior to 1965 and, hence, is not captured in the analysis summarized in Table 4.

Insert Table 4 about here

Domestic demographics had smaller effects on the labor-population growth gap and saving and investment rates in Thailand and Indonesia prior to 1990. The demographic transition occurred somewhat later there than in Singapore and Northeast Asia. In Taiwan, for example, demographics became favorable to saving around 1970, but fertility did not begin to decline until a decade later in Thailand and later still in Indonesia. The labor - population growth gap was smaller in Thailand and Indonesia. Moreover, they were less successful in translating rapid labor force growth into higher per capita income because, as explained above, they were less successful at absorbing their labor forces into higher-value-added nonagricultural sectors. Thailand and Indonesia did benefit from changes in demographic conditions in Japan, which became a major source of capital during the 1980s. Japan's enormous current account surplus can be traced, in part, to the effects of demographic conditions on the supply of savings and the demand for capital (Williamson and Higgins forthcoming).

Changing demographics in East Asia also had favorable effects on child health and education, but the resulting improvements in human resources exerted little influence on economic growth per se before 1990. Except in Japan, demographics began to have a favorable impact on human resource investment around 1970 or later. Given the inherent lags between

investment in children and improvements in the characteristics of adults and workers, fertility decline could not have influenced labor force quality to any important extent until the 1980s or later. Human resource effects are important, but they will be felt in the future more than they have been evidenced in the past. Of course, the improvements in child health and education contributed more immediately to welfare in ways not captured by conventional economic measures such as per capita income (Ahlburg and Jensen forthcoming, Jensen and Ahlburg forthcoming).

As with the gains in agricultural productivity cited above, rapid growth in employment, increased rates of saving and investment, and greater investment human resources were not inevitable consequences of East Asia's changing demographics. Rising unemployment was an alternative to rapid employment growth. A wide range of successful development policies created rapid expansion in job opportunities. These included outward-looking strategies that encouraged domestic enterprises to compete in the global market place; stable macroeconomic policies that ensured low rates of inflation, discouraged capital flight, and promoted economic efficiency; and the use of financial incentives, subsidies, and access to credit to promote the growth of key industries. In similar ways, increased investment in human and physical capital was not an automatic outcome of demographic change but depended, as well, on policies that promoted saving and increased spending on education.

### Population Policies and Programs

The countries of East Asia were pronatalist in their views and policies until the second half of the twentieth century. Japan's Meiji government prohibited not just infanticide and abortion, but also the manufacture and distribution of contraceptives because it viewed a large population as important to its military and economic power (Inoue, forthcoming). Sun Yat-Sen, the founder of the Republic of China, believed that slower population growth would undermine his nation's power (Liu, forthcoming). Thailand's government was providing bonuses for large families as late as 1956 (Chirapun, forthcoming). In Indonesia, President Soekarno was unconcerned about

rapid population growth, and family planning efforts were unpopular with community and religious leaders (Pasay and Wongkaren, forthcoming).

In the late 1950s and early 1960s, positive views toward larger populations began to give way to concern about the adverse consequences of rapid population growth. Despite opposition from some political groups, governments cautiously initiated efforts to slow rates of growth. They began to dismantle legal obstacles to fertility reduction. Japan led this trend by legalizing, in 1947, the manufacture and distribution of most contraceptive drugs and devices by private companies. (It legalized oral contraceptives only recently, however.) In 1948 it essentially legalized abortion — allowing it if a pregnancy threatened a woman’s physical or economic well-being (Inoue, forthcoming). In 1961 South Korea set aside its law prohibiting the importation or production of contraceptives. In Indonesia the Ministry of Health ended its prohibition against the distribution of contraceptives in the 1960s. Governments also joined efforts by non-governmental family planning organizations that had recently been established in the region. Private organizations such as the Population and Community Development Association of Thailand, the Indonesian Planned Parenthood Foundation, and the Planned Parenthood Federation of Korea played a particularly important role during this transitional period.

With varying speed, governments in the study countries became increasingly involved in population policies and programs. Key political and religious groups were persuaded of the importance to development of slowing population growth. The governments adopted national development plans with specific population growth-reduction targets. They initiated public campaigns to persuade couples of the importance of bearing fewer children. They attacked ignorance about modern contraceptive methods through education efforts both in the communities and in schools. Family planning clinics and distribution systems, many of them heavily subsidized, were established to increase the availability of contraceptive supplies and services.



The earliest efforts focused on education, persuasion, and increased access to modern contraceptives. Beginning in the 1970s, however, some of the governments implemented “beyond family planning” policies. Singapore adopted a comprehensive set of incentives and disincentives (Yap, forthcoming), and similar efforts were pursued elsewhere in the region. Many of these efforts relied on financial incentives, but other initiatives were designed to attack some of the social underpinnings of high fertility. In South Korea, for example, legislative action addressed gender bias in the hope that reducing couples’ preference for sons would lead to lower birth rates (Kwon, forthcoming). In the countries examined in this study, however, population measures stopped well short of coercive programs, such as India’s ill-fated sterilization campaigns and China’s one-child policy.

What led countries in developing Asia to respond so quickly and decisively to rapid population growth? And why was the response so much faster than in other developing regions? Part of the answer lies in changing demographic conditions. Asia was the most densely populated region of the world, and population growth rates were accelerating in the 1950s and 1960s. The view that a large population would contribute to the strength of a nation began to give way. Political and intellectual leaders were influenced in part by views in the West. Western academics involved in reconstruction efforts in Taiwan, South Korea, and Japan expressed concern about rapid population growth. Family planning activist Margaret Sanger, for example, was a frequent and influential visitor to Japan. Governments and scholars in East Asia conducted their own assessments, however, and many concluded that continued rapid growth represented a serious impediment to development objectives (Liu, forthcoming; Yap, forthcoming; Chirapun, forthcoming).

Several other factors contributed to Asia’s rapid and vigorous policy response. First, few Asian governments faced active opposition from powerful religious groups, in contrast with Latin America. In the Philippines the Catholic Church and in Pakistan Islamic leaders have wielded considerable influence in opposition to contraception. In the study countries, however, religious

opposition to family planning was either nonexistent or muted. Even in Indonesia, the largest Islamic nation in the world, religious leaders did not actively oppose President Soeharto's decision to promote family planning efforts.

Second, Asian countries experienced more political stability than most of Latin America and Africa. Consequently, their governments could realistically pursue longer-term goals. In South Korea, President Park Jung-Hee remained in power for 18 years after announcing his support for slowing population growth. In Taiwan, President Chiang Kai-Shek held office from 1950 to 1975. Lee Kuan Yew served as Singapore's Prime Minister from 1959 until 1990. Prior to its recent financial and political crisis, Indonesia had known only two heads of state, Soekarno, who governed from 1945 to 1966, and Soeharto, who maintained his hold on power for more than three decades. Among the six study countries only Thailand experienced repeated changes in governments, but even there the monarchy provided continuity and a stabilizing influence. Its political transitions were often relatively peaceful and unaccompanied by wrenching changes in direction. Although strong political leadership in the region allowed a rapid shift in population policy, it by no means guaranteed that outcome. The particular policies pursued depended on the views of the leadership. A shift in policy was possible in Indonesia, for example, only with Soekarno's departure (Pasay and Wongkaren, forthcoming).

Third, many Asian governments were inclined toward activism. Governments in India, Sri Lanka, the Communist regimes, and other Asian countries took it upon themselves to direct many details of their economies and social affairs. The study countries of East Asia avoided the disastrous consequences of command economies, but their governments were much more actively involved in directing their economies than were governments in the West. They were much more active in dealing with social issues as well.

East Asia's family planning programs were possibly the best run of any in the world. In a short period of time, they greatly expanded the supply of modern contraceptive services at relatively modest cost. Programs in Taiwan, South Korea, and Thailand have served as models

for other countries. Tsui (forthcoming) attributes their success to four factors. First, despite the governments' primary objective of curbing rapid population growth, their programs and policies emphasized family planning and health objectives. Second, religious or other politically powerful groups did not mount strong opposition to the programs. Third, the governments maintained a significant and sustained effort, which included significant financial support. Finally, the governments willingly and successfully worked with nongovernmental entities.

Despite their success at meeting programmatic goals, it is difficult to assess the effects of population programs and policies on demographic outcomes—that is, to determine how rapidly fertility would have declined in the absence of government action. The study countries were all experiencing rapid social and economic development. Reductions in child mortality, increased female employment, higher wages, greater educational opportunities for women, and a host of other development factors contributed to changing attitudes toward childbearing. Fertility preferences may have changed more rapidly because of government initiatives, but assessing whether this was so is not easy. Likewise, it is difficult to determine how much more rapidly effective, safe, and inexpensive birth control became accessible because of government programs. In an analysis of the determinants of fertility decline, Tsui forthcoming estimates the contribution of family planning and development factors. She concludes that the total fertility rate in other countries of the developing world would have been lower by one birth per woman from 1982 onward had they implemented family planning programs similar to those in the study countries of East Asia.

The success of population policies in East Asia came at a cost. Our authors provide differing views on the importance of external funding. Liu (forthcoming) believes that external support played a critical role in Taiwan because of the controversial nature of family planning programs, not because of their cost. Public financing of family planning did not begin there until 1968. Kwon (forthcoming) believes that external support was critical to South Korea's efforts

because of financial constraints. Of course, South Korea was a good deal poorer in 1961 than was Taiwan in 1968.

As the countries of East Asia have developed, reliance on external resources has declined and family planning programs have increasingly been financed by governments and users. The best available information suggests that annual per capita funding of family planning was approximately US 20 cents or less in the mid-1970s and rose to around US\$1.00 by the early 1990s. In Singapore and South Korea, public spending peaked during the 1980s and has declined substantially in recent years as more and more couple have turned to private family planning sources (Tsui forthcoming). At no time have family planning expenditures been a large portion of government budgets. In Thailand, for example, the peak demand on public coffers occurred in 1977, when 0.38 percent of total government expenditures went to family planning (Chirapun, forthcoming, Table 6.6.) In Indonesia, family planning expenditure reached 0.6 percent of the government's budget in 1986/87 (Pasay and Wongkaren, forthcoming, Table 7.8). Clearly, funding population programs was not a major financial burden for the countries of East Asia.

## Conclusions

In 1960 the countries of East Asia faced difficult problems. In the view of many at the time, rapid population growth was one of the most serious of those problems. Over the next three decades, these countries were extraordinarily successful in reducing fertility and slowing population growth, overcoming potential problems associated with the significant population growth that did occur, and turning changes in age structure and other demographic characteristics to their economic advantage. How this was accomplished is an important story because of its potential value to other developing countries confronting similar development issues.

Among the most important lessons that the East Asian experience offers are the following:

First, given the right conditions fertility will decline to low levels with remarkable speed. Within a period of two to three decades, the total fertility rate dropped from six births per women to two births per women or less. For the most part, coercion did not play a systematic or important role.

Second, there are different paths to low fertility. In Japan and other more industrialized countries, social and economic development drove fertility to low levels. Governments played a secondary role by either impeding or facilitating the availability of contraceptive technology. But in East Asia's developing countries, rapid fertility decline occurred, in part, as a consequence of the region's rapid social and economic development and, in part, because effective and comprehensive public programs encouraged couples to reduce their childbearing and provided them with effective and low-cost means to regulate their fertility.

Third, the development impact of population change is complex and multi-faceted. During East Asia's unusually rapid demographic transition, countries were experiencing large changes in population size and growth rates, birth and death rates, and age structure. These demographic changes influenced the relative sizes of the dependent and working age populations, the economic roles of women, incentives for saving and investment, decision-making about investing in the health and education of children, various dimensions of income inequality, international capital flows, etc. In East Asia rapid demographic transition had a substantial, favorable development impact.

Fourth, the development benefits of fertility decline and demographic transition are not automatic. Favorable outcomes depended to a great extent on the effective development policies that characterized the region. The gap between labor force and population growth was advantageous only because effective export promotion provided gainful employment to a rapidly growing labor force. Demographic change led to high saving rates because macroeconomic stability and the development of financial institutions encouraged saving and because

governments avoided large-scale transfer programs that might have undermined saving incentives. Changes in the population age structure led to greater spending on education because public policy and parents attached a high priority to education. Changes in the childbearing responsibilities of women had a favorable economic effect because governments eliminated laws and administrative policies that discriminated against women. In short, rapid demographic change was a necessary but by no means sufficient condition for rapid economic growth. Demographic changes created opportunities that East Asian countries seized by pursuing economic and social policies that supported development efforts.

That population policies and programs were a success in East Asia is an inescapable conclusion. Commitments to reducing rates of childbearing and slowing population growth rates were followed by unprecedented declines in fertility. Rapid social and economic development drove the region's demographic transformation, but government action accelerated population change and economic development.

Can the East Asian experience serve as a useful guide to development policy elsewhere? Although fertility rates have declined in other Asian countries, in Latin America, and in parts of Africa, the changes have been slower in East Asia. The demographic transition in many African countries has been particularly slow in coming. Based on just-released census figures, India's population growth rate has not slowed at all during the last two decades and recent analysis indicates that fertility rates are higher there than widely reported (Retherford and Mishra forthcoming). Pakistan and the Philippines are two other major Asian countries where fertility rates and population growth rates remain at relatively high levels. For these countries, formulating effective development policy requires a thorough appreciation for the connections between population and economic growth.

## REFERENCES

- Ahlburg, Dennis and Eric Jensen, forthcoming. Education and the East Asian Miracle. In Andrew Mason, ed., *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* Stanford: Stanford University Press.
- Bauer, John, forthcoming **a**. Economic Growth and Policy in East Asia. In Andrew Mason, ed., *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* Stanford: Stanford University Press.
- \_\_\_\_\_, forthcoming **b**. Demographic Change, Development, and the Economic Status of Women in East Asia. In Andrew Mason, ed., *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* Stanford: Stanford University Press.
- Bloom, David E. and Jeffrey G. Williamson. 1998. Demographic transitions and economic miracles in emerging Asia. *World Bank Economic Review* 12(3): 419–56.
- Cohen, Joel E. 1995. *How many people can the earth support?* New York: W. W. Norton.
- Deaton, Angus S. and Christina H. Paxson. 2000. Growth, Demographic Structure, and National Saving in Taiwan. In C.Y. Cyrus Chu and Ronald Lee, eds. *Population and Economic Change in East Asia, Population and Development Review*, a supplement to volume 26: 141-73.
- Feeney, Griffith and Andrew Mason, forthcoming. Population in East Asia. In Andrew Mason, ed., *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* Stanford: Stanford University Press.
- Gullaprawit, Chirapun. 1997. “Population Policy and Programs in Thailand.” In Andrew Mason, ed., *Population Policies and Programs in East Asia* Honolulu: East-West Center.
- Hayami, Yujiro, forthcoming. Induced Innovation and Agricultural Development in East Asia. In Andrew Mason, ed., *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* Stanford: Stanford University Press.
- Inoue, Shunichi. 1997. “Population Policies and Programs in Japan.” In Andrew Mason, ed., *Population Policies and Programs in East Asia* Honolulu: East-West Center.
- Jensen, Eric and Dennis Ahlburg, forthcoming. Within-Family Resource Pressures and Child Health in Indonesia, the Philippines, and South Korea. In Andrew Mason, ed., *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* Stanford: Stanford University Press.
- Kelley, Allen C., and Robert M. Schmidt. 1996. “Saving, Dependency and Development.” *Journal of Population Economics* 9: 365–86.
- Kwon, Tai-Hwan. 1997. “The National Family Planning Program and Fertility Transition in Korea.” In Andrew Mason, ed., *Population Policies and Programs in East Asia* Honolulu: East-West Center.
- Lee, Ronald, Andrew Mason, and Timothy Miller. 2000. Life Cycle Saving and the Demographic Transition: The Case of Taiwan. In C.Y. Cyrus Chu and Ronald Lee, eds. *Population and Economic Change in East Asia, Population and Development Review*, a supplement to volume 26: 194-223.

- \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_, forthcoming. Saving, Wealth, and the Demographic Transition in East Asia. In Andrew Mason, ed., *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* Stanford: Stanford University Press.
- Liu, Paul K. C. 1997. "Population Policies and Programs in Taiwan." In Andrew Mason, ed., *Population Policies and Programs in East Asia* Honolulu: East-West Center.
- Mason, Andrew, ed., forthcoming **a.** *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* Stanford: Stanford University Press.
- Mason, Andrew, forthcoming **b.** Population, Capital, and Labor. In Andrew Mason, ed., *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* Stanford: Stanford University Press.
- Mason, Andrew, ed., forthcoming **c.** *Population Policies and Programs in East Asia* Honolulu: East-West Center.
- Okunishi, Yoshio, forthcoming. Changing Labor Forces and Labor Markets in Asia's "Miracle" Economies. In Andrew Mason, ed., *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* Stanford: Stanford University Press.
- Pasay, N. Haidy A., and Turro S. Wongkaren. 1997. "Population and the Asian Miracle: Population Policy and Programs in Indonesia." In Andrew Mason, ed., *Population Policies and Programs in East Asia* Honolulu: East-West Center.
- Retherford, R. D., and V. K. Mishra, forthcoming. Comparison of fertility trends estimated from India's Sample Registration System and India's First and Second National Family Health Surveys. National Family Health Survey Subject Report. Mumbai: International Institute for Population Sciences and Honolulu: East-West Center.
- Summers, Robert, and Alan Heston. 1991. "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950–1988. (Mark 5.6a update, which includes data to 1991.)" *Quarterly Journal of Economics* 105(2): 327–66.
- Toh, Mun Heng, forthcoming. Savings, Capital Formation, and Economic Growth in Singapore. In Andrew Mason, ed., *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* Stanford: Stanford University Press.
- Yap, Mui-Teng. 1997. "Population Policies and Programs in Singapore." In Andrew Mason, ed., *Population Policies and Programs in East Asia* Honolulu: East-West Center.
- UN [United Nations] Population Division. 1998. *World population prospects: The 1998 revision*. New York: United Nations.
- Williamson, Jeffrey G. and Matthew Higgins, forthcoming. The Accumulation and Demographic Connection in East Asia. In Andrew Mason, ed., *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* Stanford: Stanford University Press.



Figure 1. Economic support ratio, Southeast Asia

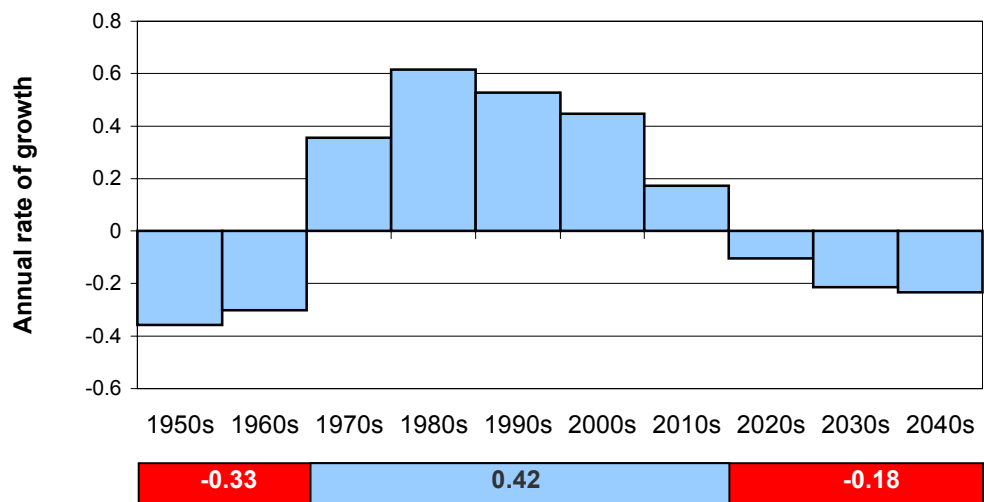
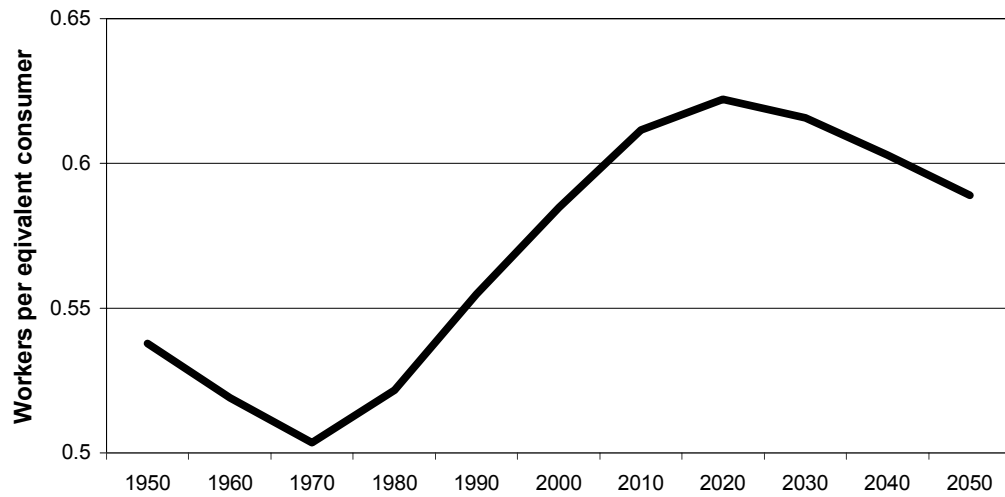


Figure 2. Growth Rates (%) of Economic Support Ratios, Selected Asian Countries

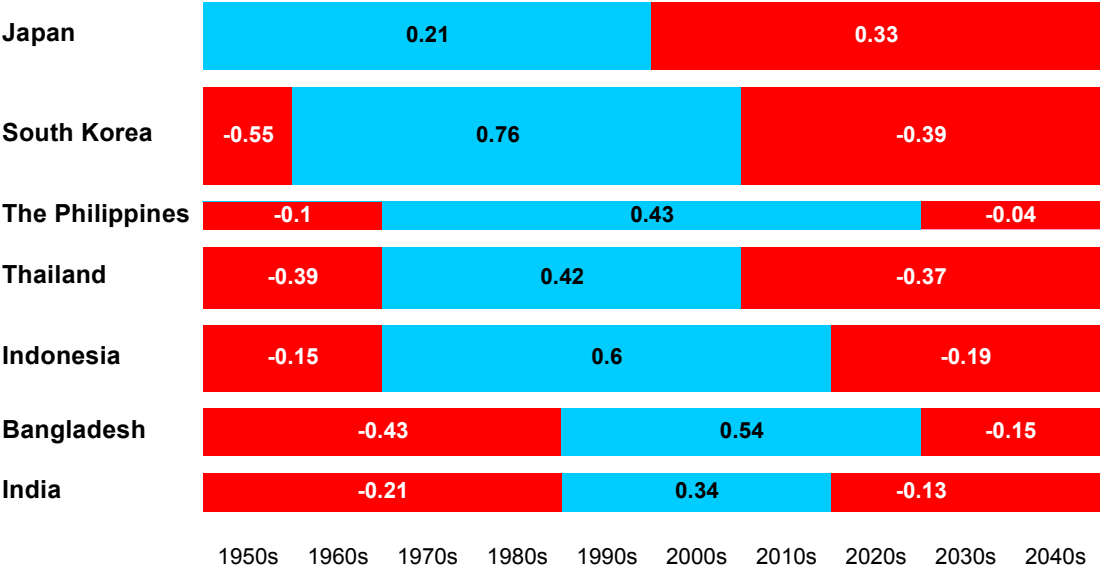


Table 1. Summary of agricultural statistics: six East Asian countries, 1960–90

	Japan	South Korea	Taiwan <sup>a</sup>	Singapore	Thailand	Indonesia
Percentage of total labor force in agriculture						
1960	33.1	61.3	56.1	7.4	83.7	74.8
1990	7.3	18.1	12.6	0.4	64.1	55.2
Value added in agriculture (percentage of total GDP)						
1960	13.1	35.8	28.9	3.8	36.4	51.5
1990	2.5	8.7	4.1	0.3	12.5	19.4
Annual labor force growth, 1960–90 (%)						
Combined	1.2	2.9	3.1	3.5	2.9	2.5
Agriculture	–3.9	–1.2	–1.9	–6.5	2.0	1.5
Nonagriculture	2.3	5.4	5.4	3.7	5.5	4.5
Annual growth in GDP per worker, 1960–90 (%)						
Combined	4.9	5.0	5.7	4.8	4.5	3.4
Agriculture	4.5	4.4	4.1	5.9	1.8	1.2
Nonagriculture	4.2	3.7	4.4	4.6	2.9	3.2
Arable land per agricultural worker (hectares per worker)						
1970	0.47	0.38	0.54	0.18	0.88	0.61
1990	0.88	0.55	0.84	0.20	0.86	0.47

Source: Mason forthcoming **a**.

a. Labor force statistics for Taiwan are based on employment rather than on the labor force.

Table 2. Population and labor force growth: average annual growth rates in major world regions, 1960–90

Region	Rates of growth (%)	
	Population	Labor force
Africa	2.6	2.3
Latin America	2.3	2.7
Asia		
South Asia	2.6	2.5
High performers	1.9	2.7
Europe and North America	0.8	1.1

Source: Mason forthcoming **a**.

Note: Values are unweighted averages of country values.

Table 3. Predicted saving rates (%), 1960–90, based on Taiwan’s demographics: five alternative models

Model	Over demographic transition			Over 1960–90 period		
	Minimum	Maximum	Change	1960	1990	Change
Williamson and Higgins (forthcoming)	1.6	44.7	43.0	1.6	36.8	35.1
Kelley and Schmidt (1996)	8.3	33.4	25.1	9.9	30.9	21.0
Toh (forthcoming)	8.7	53.7	45.0	9.1	46.2	37.1
Lee, Mason, and Miller (forthcoming)	5.1	19.6	14.5	9.3	16.0	6.7
Deaton and Paxson (2000)	18.2	24.6	6.5	19.3	22.4	3.1

Table 4. Accounting for growth in output per capita: four Asian countries, 1965–90

Factor	Japan	Taiwan	South Korea	Thailand	Taiwan with saving effects
Growth of output per worker	4.5	5.7	6.6	4.3	5.7
Contribution of specified factor					
Productivity	1.5	2.5	4.5	1.9	2.5
Investment	2.6	2.8	1.8	2.3	1.8
Investment (demographic)					0.9
Labor force growth	0.1	0.1	0.1	0.1	0.1
Interaction	0.3	0.3	0.3	0.1	0.3
Contribution of demographics	0.1	0.1	0.1	0.1	1.0
Percentage contribution of specified factor to growth in output per worker					
Productivity	33.8	44.4	67.4	43.1	44.4
Investment (nondemographic)	58.0	48.5	26.6	52.6	31.4
Combined demographic effects	2.2	2.5	1.3	1.3	18.2
Interaction	6.1	4.7	4.7	3.1	4.7
Growth of output per capita	4.7	6.9	7.7	4.8	6.3
Contribution of specified factor					
Output per worker	4.5	5.7	6.6	4.3	5.7
Support ratio	0.2	1.2	1.1	0.5	1.2
Contribution of demographics	0.3	1.3	1.2	0.5	1.8
Percentage contribution to growth in output per capita					
Productivity	32.1	36.8	58.0	38.8	39.8
Investment (nondemographic)	55.0	40.2	22.8	47.3	28.6
Combined demographic effects	7.1	19.2	15.1	11.2	27.7
Interaction	5.8	3.9	4.1	2.8	3.8

Note: Values are based on an elasticity of output with respect to capital of 0.4. The contribution of demographics includes the combined impact of changes in labor force growth and changes in saving/investment induced by demographics in Taiwan. The interaction is not included.

Source: Mason forthcoming **b**.